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A Process for Developing Fishery Management Plans in the Central and Arctic Region

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A PROCESS FOR DEVELOPING FISHERY MANAGEMENT PLANS IN THE CENTRAL AND ARCTIC REGION

by

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PREFACE

This document describes the process employed by the Central and Arctic Region of the Department of Fisheries and Oceans for developing Fishery Management Plans in the Central and Arctic Region. It also includes the process used to set priorities for developing the plans.

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ABSTRACT

de March, L. 1991. A process for developing fishery management plans in the Central and Arctic Region. Can. Manuscr. Rep. Fish. Aquat. Sci. 2094: iv + 24 p.

The Department of Fisheries and Oceans, Central and Arctic Region is adopting a more formal approach to the development of fishery management plans. The overall fishery management plan will consist of sub-plans for fishing, compliance and harvest statistics, inspection, research and monitoring, habitat, economic development, human resources development, and communications and education.

Plans will be developed by the appropriate groups within Fisheries and Oceans (for example science for the research and monitoring plan) in cooperation with management board.

Key words: fishery managememt; planning.

RÉSUMÉ

de March, L. 1991. A process for developing fishery management plans in the Central and Arctic Region. Can. Manuscr. Rep. Fish. Aquat. Sci. 2094: iv + 24 p.

La Région du Centre et de l'Arctique du ministère des Pêches et des Océans adopte une approche plus formelle dans l'élaboration des plans de gestion de la pêche. Le plan global de gestion de la pêche sera composé de sous-plans pour la pêche, la conformité, les données statistiques sur les prises, l'inspection, la recherche et la surveillance, l'habitat, le développement économique, le développement des ressources humaines et, enfin, les communications et l'éducation.

Les plans seront élaborés par les groupes appropriés au sein du ministère des Pêches et des Océans (p. ex. le groupe Sciences pour le plan concernant la recherche et la surveillance) en collaboration avec le comité de direction.

Mots-clés: gestion de la pêche; planification.

INTRODUCTION

The Central and Arctic Region of the Department of Fisheries and Oceans has responsibility for managing fisheries in the Northwest Territories (NWT) and along the Yukon north coast. Currently DFO, Central and Arctic Region, manages about 350 stocks. There are 247 commercial fisheries for which DFO sets quotas. Safe harvest levels (SHL's) are set for only some of the over 250 domestic fisheries. DFO has not followed a formal process for developing fishery management plans. Rather it has managed by "rule of thumb" for many fisheries. For some Arctic charr and marine mammal fisheries, stock assessments have been carried out and population data collected to allow a more scientific SHL to be set. With growing human populations in the north, increasing tourism and increasing commercial fishing through economic development there is increased pressure on fishery resources. There is, therefore, an increasing need for SHL's which are scientifically defensible and for a clear understanding of how stocks will be managed.

This report outlines the formal fishery management planning process adopted by the Central and Arctic Region. It will lead to fisheries management plans containing sub-plans for fishing, compliance and harvest statistics, inspection, research and monitoring, habitat, economic development, human development and communication and education.

STATUS OF FISHERY MANAGEMENT PLANS (late 1990)

PLANS UNDER DEVELOPMENT

Beaufort Sea beluga management plan

In 1977 Mr. Justice Berger recommended establishing a beluga sanctuary in the Niakunak Bay - Shallow Bay area. Hunting would be allowed but industrial activities would not. The Minister's Committee on Whales and Whaling inquired about the status of this recommendation in 1982. In response to this request, the Arctic Offshore Development Committee (ARCOD) of DFO was asked to provide advice on the need to protect beluga habitat in west Mackenzie Bay. ARCOD prepared discussion and background papers on management and protection options for Beaufort Sea beluga (ARCOD 1985).

In response to ARCOD's proposal, a steering committee was struck by the Arctic Directors General Committee to oversee the development of a management strategy. A technical working group was formed. The group's membership included a DFO marine mammal management biologist, two native resource harvesters, a DFO fisheries officer, an oil company biologist and a biologist to provide oceanographic information.

The land claim for the region was settled in 1984 and under the Inuvialuit Final Agreement (IFA) the Fisheries Joint Management Committee (FJMC) was formed. DFO submitted the draft management strategy to the FJMC in 1987. The FJMC has been consulting with resource users on the management strategy. The consultations were completed in March, 1989. The plan is being reviewed by DFO and should be published and implemented for the 1991 hunting season.

The beluga management strategy has been produced during a period of great change in the way Arctic fisheries are being administered and in how resources are being managed. Responsibilities and procedures have not yet been worked out fully for the interaction between DFO and the FJMC. For instance, the DFO appointee on the FJMC does not represent DFO while sitting on the committee and the FJMC has to interact with other DFO personnel for specific joint management issues.

DFO had input to the draft management strategy for Beaufort beluga, but has not been involved in the process while the management plan is being finalized. There also has been little or no contact between DFO and FJMC since the report was sent to them.

Great Bear Lake Management Plan

Some time prior to 1983 the Den of Fort Franklin, believing that they were not receiving enough benefits from the recreational fishery, proposed a commercial fishery for Great Bear Lake. Because a commercial fishery could affect the lodge- based trophy recreational fishery, a working group was established to develop management goals. The working group comprised representatives from DFO, Indian and Northern Affairs Canada, Government of Northwest Territories (GNWT) Renewable Resources and GNWT Economic Development and Tourism.

The working group circulated a background paper to the lodge operators and to residents of Fort Franklin in 1984. The paper contained information on current uses, fishery status, concerns and alternative actions.

The working group produced its final report in 1985. It contains background information and analyses, goals, recommendations

and rationales. One of the recommendations was to set up an advisory board for fishery management. Instead of an advisory board, a management committee (in effect a management board) was appointed in 1986. Its membership consists of two Den representatives, a DFO biologist, one representative from each of GNWT Renewable Resources, GNWT Economic Development and Tourism and GNWT Tourist Industry Association, one coordinator from each of DFO and Fort Franklin and an independent chairman contracted by DFO.

The committee is charged with the development of a management plan. The plan as it now exists, consists of the working group paper (Review of Great Bear Lake Management Goals 1985), a paper on the status of the lake trout (Roberge and Dunn 1988) which also includes recommended total allowable harvests (TAH or SHL) (reviewed by DFO's Arctic Fisheries Scientific Advisory Committee [AFSAC]) and a brief paper on objectives and strategies agreed to by interested parties.

Great Slave Lake - East Arm lake trout management plan

There has been a commercial fishery on Great Slave Lake since the 1940's. There also has been a recreational fishery on the lake, especially in the East Arm. The Great Slave Lake Advisory Committee was formed in 1977 at the suggestion of the Northwest Territories Fishermen's Association and DFO.

The committee considers problems relating to the fishery and people depending on it and makes recommendations to DFO on solutions to those problems. The committee currently has two DFO members, four from the NWT Fishermen's Federation, two from the Dené Nation, one from the NWT Travel Industry Association, one from the Freshwater Fish Marketing Corporation, one from GNWT Renewable Resources and one from GNWT Economic Development and Tourism. The committee is chaired by the DFO South/Central Arctic Area Manager.

Concern was expressed about the lake trout stock when expansion of lodge capacity was requested and an increase in itinerant recreational fishing was noted. The committee has contracted the preparation of a background document to be used in consultations towards the development of a management plan for the lake trout of the East Arm of Great Slave Lake (Hubert 1989). The second draft of the background document has been reviewed by the committee. The document includes information for the development of a stock status report but does not fit the format which DFO envisages for management plans, nor does it contain detailed "sector" plans. The consultant predicts that 18 months will be required to complete and implement the plan. The scientific information in the plan will be submitted to AFSAC for review.

COMPONENTS OF PLANS UNDER DEVELOPMENT

AFSAC reports

The Arctic Fisheries Scientific Advisory Committee is a committee which was formed primarily to provide scientific advice on fish stocks and safe harvesting levels (SHL's) to the DFO Regional Director General (RDG) and to the Regional Director (RD), Fisheries and Habitat Management (F&HM), Central and Arctic Region. The establishment of SHL's is a key component of any fishery management plan.

AFSAC review priorities are set by the AFSAC executive committee in consultation with the Regional Director, Fisheries and Habitat Management and with the Director, Biological Sciences. The AFSAC chairman requests background papers (stock status reports) on the stocks from appropriate staff members. The background papers are reviewed by the appropriate AFSAC subcommittee (fish or marine mammals) and any required revisions are made by the author(s). The subcommittee prepares a report summarizing available information and providing required advice and rationale on harvest levels, other management requirements and research needs. After approval of the summary document by the Director, Biological Sciences and the Arctic ADM's Committee, it is provided to the Regional Director General and the Regional Director, Fisheries and Habitat Management.

In 1986/87 and 1987/88 AFSAC reviewed and developed advice on twelve individual fish stocks, three fish stock complexes, commercial quotas for Arctic charr, six marine mammal stocks and one marine mammal species. In 1988/89 AFSAC reviewed and developed advice on five fish stocks, a scallop stock and ten marine mammal stocks.

AFSAC is planning reports on fifteen new stocks in 1989/90 and second reports on two stocks.

Stock status brochures

Stock status brochures contain information on the biology, current and historic exploitation, value and state of the stock and its habitat. They are written in simple language for public consumption. Their preparation is one step in consultation on the development of a fishery management plan.

Four stock status brochures have been prepared. The written material for the brochure for the Arctic charr stocks of the Rat and Big Fish rivers is ready for publication as is the material for the Arctic charr stocks of the Firth and Babbage rivers and for the Jayco River Arctic charr stock.

The four stock status brochures now nearing completion were prepared by DFO Regulatory and Native Affairs from AFSAC Stock Status Reports. Two of the stock status reports were prepared by DFO Area biologists and the other two were prepared by a biologist under contract to DFO.

Fishing plans

The Eastern Arctic area has three fishing plans under development for 1989/90. They are for Cumberland Sound scallops, Cumberland Sound turbot, and Southeast Baffin beluga. All three stocks have been reviewed by AFSAC. The fishing plans will be the major component of fishery management plans for these stocks. Draft fishing plans for eight Eastern Arctic stocks are proposed to be completed by October, 1990; three in the Western Arctic by January, 1991; a further plan is proposed for the East Arm of Great Slave Lake.

FISHERY MANAGEMENT PLANS FOR OTHER FISHERIES

Many other fisheries in the Northwest Territories currently are being managed at some level. Some are being managed mainly for commercial fisheries, some for subsistence fisheries, some for recreational fisheries, and others for mixed fisheries, depending on the needs of the local residents. Implicit plans for the management of these fisheries exist, but explicit written plans have not been prepared.

SUMMARY

Arctic fishery management to date has been carried out without structured management plans and without a formal process to develop the plans. The three formal management plans initiated to date have a number of things in common. They are the result of specific problems or concerns about a resource and they have been carried out on an ad hoc basis in stages, starting with the equivalent of an AFSAC stock status report. All have been developed by or with the aid of a joint management board (MB).

By the end of 1989/90 about 50 stocks will have been the subject of AFSAC and other stock status reports, and at least four stock status brochures will be published in 1990/91. Fishing plans will be developed for Cumberland Sound scallops and turbot and South-east Baffin beluga in 1989/90. Three management plans currently are being developed. They are for Beaufort Sea beluga, Great Bear Lake lake trout and lake trout in the East Arm of Great Slave Lake. Draft fishing plans for eight Eastern Arctic stocks are proposed to be completed by October, 1990; three in the Western Arctic by January, 1991.

THE PROCESS

CONTENT

"The Ice Goes Out", (Canada DFO 1988) the regional fishery management discussion paper, outlines one option for the content of a fishery management plan. The process adopted includes the same basic ingredients as set out in "The Ice Goes Out" but it is packaged slightly differently. Depending on the needs of individual fisheries, not all of these sections will appear in all plans. The main sections of a fishery management plan will be:

1) the fishing plan which contains the SHL, allocation, fishery enhancement, stocking and specific measures required to manage the fishery;

2) the compliance and harvest statistics plan which contains methods for ensuring SHL's and control measures are adhered to and a plan for collecting statistics on all harvests;

3) the inspection plan which ensures the wholesomeness of fish, no matter who is to consume them (domestic as well as export);

4) the research and monitoring plan which identifies the information required to make management decisions and the ways of obtaining this information;

5) the habitat plan which addresses habitat protection and/or restoration requirements;

6) the economic development plan which addresses required economic analyses for proposed commercial fisheries and lodges;

7) the human resources development plan which identifies opportunities in fishery management for local people, identifies specific training needs, identifies skills required in all aspects of the fishery and recommends training and assistance programs to develop these skills and to facilitate access to existing training and assistance programs;

8) the communication and education plan which identifies communications required between resource users and resource managers and how resource users will be made aware of DFO policies and the management plan; and

9) other plans as required.

STEPS IN THE PROCESS

Figure 1 summarizes the process and Fig. 2 provides an overview. Figures 3 to 6 detail the various steps. Appendix 2 summarizes roles and responsibilities by activity.

The basic steps in the process are:

1) identifying needs,
2) establishing priorities,
3) preparing a stock status report,
4) scientific review of biological data and establishing the SHL,
5) deciding whether a management plan can or should be prepared,
6) developing the management plan,
7) approving and publishing the management plan,
8) implementation, and
9) review and revision.

Identifying needs

Perceived needs for management plans may be identified by resource users or resource managers. These are channelled to either the management board and then to DFO or to DFO for priority setting at the autumn Fisheries and Habitat Management Directorate meeting.

Establishing priorities

The Central and Arctic Region contains a very large number of fish and marine mammal stocks, many of which are harvested in subsistence (over 250 stocks), recreational (125 stocks) or commercial fisheries (250 stocks). It is not possible to prepare management plans for all of them proactively. Management plans can be prepared for only the most important stocks or groups of stocks or species. The importance of the stock is based on its cultural and economic significance and on other factors such as whether it may be endangered or over-harvested. Even among the important stocks it will be necessary to set priorities for developing management plans.

Priorities will be established by the Regional Director, Fisheries and Habitat Management, in consultation with F&HM staff, the management board, DFO Science, and DFO Economics. A priority setting process has been developed (Appendix 4).

Preparing a stock status report

Stock status reports are the first step in preparing a management plan. They will be prepared to give a history of the stock and to outline all available data on it, from biological through economic and cultural importance. Stock status reports will be commissioned by the management board, if one exists, and Regional Director, F&HM, in response to the established priorities. They will be coordinated and edited by the Area, DFO Fish and Marine Mammal Management (F&MMM) or Science. The various sections of the report will be prepared by Science, Economics, Area, Habitat, and other staff as necessary.

The stock status report will include the data required for the AFSAC background report. The management boards would be involved in that they are responsible for conducting harvest studies and would supply harvest and cultural/social data.

Scientific review and establishing the SHL

One section of the Inuvialuit Final Agreement (Indian and Northern Affairs 1984) states that "Within their respective jurisdictions, the governments having responsibility for wildlife management shall determine the harvestable quotas for wildlife species based on the principles of conservation ---". Another section allows the FJMC to recommend to the Minister "on subsistence quotas for fish, harvestable quotas for marine mammals, Inuvialuit commercial fishing, --- ". The agreement also says that quotas are to be set jointly by the Inuvialuit and the government. DFO does, however, retain ultimate responsibility for managing fisheries and for conserving fishery resources and is currently setting all SHL's. The SHL's will be based on AFSAC's scientific advice.

AFSAC will review the biological information in the stock status report, provide general scientific advice, propose a SHL and other management requirements and also advise on the confidence in the SHL. After approval by the Arctic ADM's Arctic Program Committee, advice will be forwarded to the Regional Director, Fisheries and Habitat Management and then to the management board.

Decision time

After the status report has been completed, and while the biological information is being reviewed by AFSAC, other sections will be reviewed by appropriate groups to determine if there is enough available information to develop a management plan. Then a determination will be made whether any missing and required information should be collected and whether a management plan should be developed. A cost-benefit analysis will be employed to help make the decision. The decision would be made jointly by the Regional Director and the management board. A decision would also be made at this time on whether to publish a Stock Status Brochure.

Developing the management plan

The Fishery Management Plan consists of a number of distinct sections, each of which describes a particular activity. Each section will be prepared by the organizational unit responsible for that activity (Appendix 2). It may be possible to take a phased approach to developing the complete plan. The fishing plan, compliance plan and harvest statistics plan should be developed first. Other sections may not be required for all stocks.

Overall coordination and preparation will be the responsibility of F&MHM. If future management boards are given more responsibilities, they could prepare the management plan in cooperation with Area and F&MHM staff as long as their members or staff had the knowledge and skills/training to do so.

Fishing plan

Because native peoples have first rights to harvest the resource, the fishing plan will be the responsibility of the management board in consultation with Hunters and Trappers Committees (HTCs). In the absence of a management board, this plan will be prepared by the Area in consultation with the HTCs. The fishing plan will include the SHL, allocation of the SHL, restrictions, closures, control measures, stock enhancement and the like.

Compliance and harvest statistics plan

The compliance portion of plan is the responsibility of the Area Manager in consultation with local HTCs. It will address how compliance with management requirements will be achieved. The management board will have the responsibility for obtaining catch statistics for the domestic harvest, DFO for statistics on the commercial fishery catch and the GNWT for recreational fishery catch statistics.

Inspection plan

Currently, inspection is required only for fish exported from the NWT. A plan will be prepared to offer inspection services to domestic fish consumers if and when required. This plan is to be developed by DFO Inspection. A plan will not be required for inspection of commercial exports because this is a statutory requirement.

Research and monitoring plan

In the Inuvialuit Claim Area the FJMC advises the Minister of Fisheries and Oceans on research policies (Indian and Northern Affairs 1984). In the Inuvialuit Renewable Resource Conservation and Management Plan arising from the IFA, two established objectives are to support renewable resource research and to prepare annual reports on research activities. The former objective has been assumed by FJMC which establishes a list of research priorities. Various agencies, including DFO, submit to FJMC proposals for individual research projects for approval and funding.

For future management boards it would be preferable to have the research priorities developed in conjunction with DFO (and in particular Science) for more effective coverage and to avoid duplication of effort. It would be beneficial to negotiate a similar arrangement for the Inuvialuit Settlement Area.

Monitoring is defined as sampling to determine population parameters to ensure that population numbers can continue to support the SHL. The Area Office and F&MHM would be responsible for developing the monitoring plan. Results from monitoring will be used in the review and revision of the plan.

Habitat plan

This plan will identify potential threats to fish habitat, required protection measures, any habitat damage which has already occurred and methods for rehabilitation or enhancement if required. Its development will be the responsibility of the Area habitat biologist with assistance from Resource Impact.

Economic development plan

An economic development plan will be required when an economic enterprise such as a commercial fishery or recreational fishery lodge

is involved or if there is the potential for economic development of the fishery resource. The economic plan would include fishery development and would be produced jointly by all groups having an interest in fishery and northern development (DFO, Indian and Northern Affairs Canada [INAC], GNWT). The preparation would be coordinated by DFO Program Coordination and Economics. It will contain economic cost-benefit analyses and options for conducting commercial or recreational fisheries in a manner which maximizes net economic benefits.

Human resources development plan

Human resources development could include training of local residents to carry out fishery management functions. Other organizations such as INAC, GNWT and Employment and Immigration Canada would be involved in its development. The Area manager would carry out the activity for DFO.

Communication and education plan

This plan addresses communication between resource users and resource managers. It would address explaining the fishery management plan and DFO programs as well as providing a forum for the interchange of information and ideas. This plan will be the responsibility of the Area manager with assistance from Regulatory and Native Affairs in cooperation with the management board and HTCs.

Approving and publishing the management plan

After review and modification of the plan by all interested parties, it will be approved by the Director General, Central and Arctic Region.

The management board will be responsible for the publication of the plan. A simplified version will be made available to the public. In the absence of a management board, DFO will publish the plan.

Implementation

The Area manager will implement the plan, but specific components will be implemented by the parties identified in the plan.

Review and revision

Results of monitoring and other studies/research have to be applied to the plan on a regular basis. Minor revisions could be made on an annual basis or whenever required by changing conditions. A full review of the plan will be scheduled at least every five years.

Monitoring and evaluating the plan

The plan will be monitored and evaluated by R&NA and the management board to ensure its effectiveness.

ACKNOWLEDGMENTS

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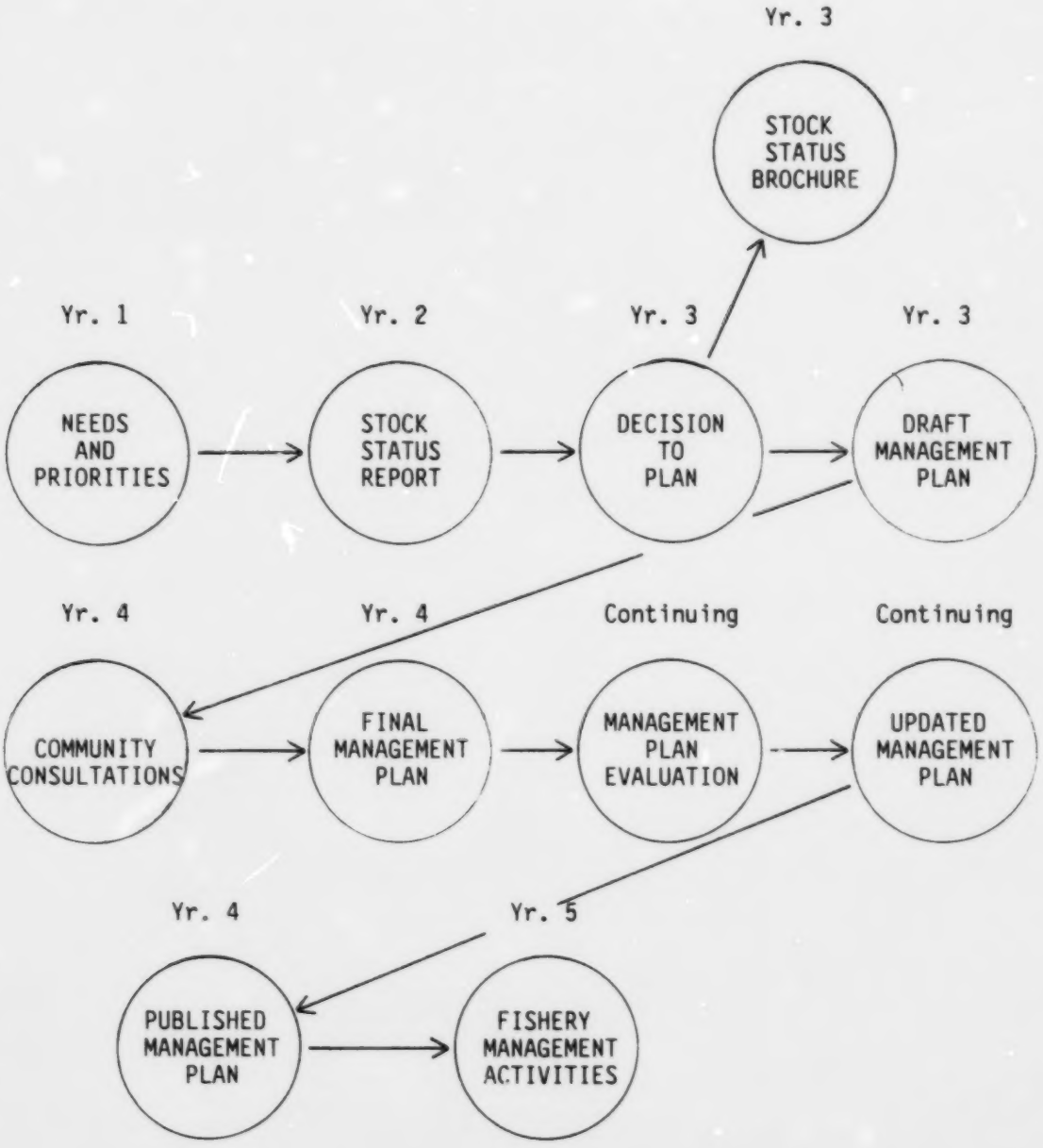

Note: The process begins in May of year 1 and Activities are carried out in April of year 5, therefore the planning takes 4 years.

Fig. 1. Summary of the fishery management plan process.

Management Plan Process
Flow Charts

The flow charts outline **ACTIONS**, Products, responsibilities and timing.

IDENTIFY NEEDS AND PRIORITIES	Fig. 3
PREPARE STOCK STATUS REPORT	Fig. 4
REVIEW STOCK STATUS REPORT	Fig. 4
DECIDE WHETHER TO CONTINUE PLANNING	Fig. 4
DECIDE WHETHER TO PROVIDE STOCK BROCHURE	Fig. 4
DEVELOP MANAGEMENT PLAN COMPONENTS	Fig. 5
REVIEW DRAFT MANAGEMENT PLAN	Fig. 5
REVISE AND APPROVE MANAGEMENT PLAN	Fig. 5
PUBLISH AND DISTRIBUTE MANAGEMENT PLAN	Fig. 5
IMPLEMENT MANAGEMENT PLAN	Fig. 6
CARRY OUT RESEARCH	Fig. 6
MONITOR AND EVALUATE PLAN AND IMPLEMENTATION	Fig. 6
UPDATE MANAGEMENT PLAN	Fig. 6

Fig. 2. Process overview.

ACTION/Product	Responsibility	Timing
REQUEST NEEDS AND PRIORITIES	F&MMM	Yr. 1, May
Inputs	Users, MB, DFO, Others	Yr. 1, June
PREPARE DRAFT PRIORITY LIST	F&MMM	Yr. 1, Aug.
REVIEW DRAFT PRIORITY LIST	All interested parties	Yr. 1, Sep.
IDENTIFY INTERNAL PRIORITIES AT F&HM DIRECTORATE MEETING	Directorate Staff	Yr. 1, Oct.
CONFIRM MANAGEMENT PLAN PRIORITIES	RD, F&HM; MB	
List of priority stocks & Timetable	F&MMM	Yr. 1, Nov.
NOTIFY ALL GROUPS OF DECISIONS, AGREEMENTS	RD	Yr. 1, Dec.
PROCEED WITH SPECIFIC PLANS	RD (see Fig. 3)	

Fig. 3. Identifying needs and setting priorities.

ACTION/Product	Responsibility	Timing
REQUEST INPUTS TO STOCK STATUS REPORTS	F&MMM, Science or Area*	Yr. 1, Jan.
Inputs	F&MMM, Science, Area, Economics, MB, Resource Impact, Others (may vary)	Yr. 2, Oct.
Stock Status Report	F&MMM, Science or Area	Yr. 2, Dec.
REQUEST REVIEW OF STOCK STATUS REPORT	RD, F&HM	Yr. 2, Dec.
PERFORM REVIEW OF BIOLOGY	AFSAC	Yr. 2, Mar.
Scientific Advice & Proposed SHL	AFSAC	Yr. 2, Mar.
REVIEW PROPOSED SHL	Arctic ADM's Program Committee	Yr. 2, Mar.
SHL	RD, F&HM	Yr. 2, Mar.
CARRY OUT COST/BENEFIT ANALYSIS ANALYSIS OF PLANNING	Economics	Yr. 2, Mar.
PERFORM OTHER REVIEWS AS REQUIRED	F&HM, Econ., etc.	Yr. 2, Mar.
Consolidation of Reviews	F&MMM	Yr. 3, Apr.
DECIDE WHETHER TO CONSIDER PLANNING AND SCOPE OF PLANNING	RD, F&HM	Yr. 3, Apr.
PROCEED WITH MANAGEMENT PLANNING PROCESS		
PROCEED TO MANAGEMENT PLAN DEVELOPMENT	(Fig. 4)	
or		
REQUEST MORE DATA	F&MMM	Yr. 3, Apr.
Additional Data (back to stock status report)	Applicable Responsible party	Yr. 3, Dec.
or		
STOP PLANNING		Yr. 3, Apr.
DECIDE WHETHER TO PRODUCE STOCK STATUS BROCHURE	F&MMM	Yr. 3, Apr.
Stock Status Brochure (basis for consultation)	Area	Yr. 3, Dec.

* To be assigned by the appropriate Director at the request of RD, F&HM.

Fig. 4. Preparation of stock status reports and brochures, decision to plan.

ACTION/Product	Responsibility	Timing
INITIATE PLAN DEVELOPMENT	RD, F&HM	Yr. 3, Apr.
Fishing Plan	MB, HTC or Area	Yr. 3, Dec.
Compliance and Harvest Statistics Plan	Area, HTA	Yr. 3, Dec.
Inspection Plan	Inspection	Yr. 3, Dec
Research and Monitoring Plan	Science, F&HM, Area, MB	Yr. 3, Dec.
Habitat Plan	Area, RI	Yr. 3, Dec.
Economic Development Plan	Economics, MB & Others	Yr. 3, Dec.
Human Resources Development Plan	Area, Other Government Dept's	Yr. 3, Dec.
Communication and Education Plan	Area, R&NA	Yr. 3, Dec.
COMPILE AND EDIT PLAN COMPONENTS	F&MMM	Yr. 3, Jan.
Draft Management Plan	F&MMM	Yr. 3, Mar.
REVIEW DRAFT MANAGEMENT PLAN	RD, All Responsible Parties	Yr. 4, Apr.
Revised Management Plan	F&MMM	Yr. 4, May
CONSULT WITH COMMUNITIES	MB, DFO	Yr. 4, Oct.
Final Management Plan	F&MMM	Yr. 4, Dec.
APPROVE PLAN	DG, MB	Yr. 4, Jan.
Approved Final Plan		Yr. 4, Feb.
PUBLISH AND DISTRIBUTE MANAGEMENT PLAN	MB, F&MMM	Yr. 4, Mar.

Fig. 5. Management plan development.

ACTION/Product	Responsibility	Timing
IMPLEMENT PLAN	Area, All Responsible Parties	Yr. 4, Apr.
MONITOR AND EVALUATE PLAN	R&NA, MB	Continuing
UPDATE MANAGEMENT PLAN	All Responsible Parties	<= 5 yrs.
REVIEW AND APPROVE REVISED PLAN	(Fig. 4)	

Fig. 6. Implementation and updating.

Appendix 1. Responsibility by organizational unit.

Regional Director, F&HM

- responsible for DFO management activities
- directs the process
- sets management plan priorities (in consultation with F&HM, Economics, Science, RDG and management board) and notifies all participants
- requests review of stock status report
- receives approved AFSAC advice from ADM's committee
- sets the SHL
- decides whether to plan and scope of plan
- requests inputs to management plan
- requests review of draft management plan
- gives directorate approval to management plan
- approves and funds research as appropriate

Management Board

- receives identified needs from NTA's, public, etc.
- sets its own priorities for planning
- consults with F&HM to set final priorities
- carries out harvest and social studies
- prepares harvest section of status report
- develops fishing plan/sets quotas
- consults with resource users while developing plan
- advises Minister on research priorities (Inuvialuit Final Agreement only)
- helps prepare compliance and harvest statistics plan
- helps prepare economic development plan
- conducts community consultations on the plan
- publishes the plan
- implements the fishing plan
- helps monitor and evaluate the plan

F&MMM

- overall lead for coordinating management plan development
- requests needs and priorities
- prepares list of priority stocks and timetable for planning
- coordinates stock status report preparation, produces final stock status report (individual sections are produced by others)
- prepares appropriate parts of stock status report
- provides scientific advice through AFSAC
- compiles management plan components for review and finalizes management plan
- involved in preparing research and monitoring plans
- publishes management plan if not done by management board
- carries out research

Area Office

- advises on needs and priorities
- receives requests for management action
- reviews draft stock status report
- develops stock status brochure
- develops habitat plan with Resource Impact
- develops compliance and harvest statistics plan
  (with input from MB where applicable)
- involved in developing monitoring plans
- develops human resources development plan
- develops communication and education plan
  (with R&NA input)
- reviews draft management plan
- implements plan
- contact point for Management Boards

DFO Science

- may identify need to plan
- aids in setting priorities
- contributes to stock status reports (stock identification, etc.)
- manages AFSAC process
- provides scientific advice through AFSAC
- assists in decision on whether to plan
- develops research plan (with others)
- reviews draft management plan
- carries out required research

R&NA

- advises on needs and priorities
- reviews draft stock status report
- helps develop communication and education plan
- reviews draft management plan
- develops any new/changed regulations required
- monitors and evaluates plan
- modifies process as required

Program Coordination and Economics

- may identify planning needs
- assists in priority setting
- prepares economic section of stock status report
- aids in economic analysis of domestic harvest data if required
- provides economic cost/benefit analysis of management plan
- reviews draft stock status report
- assists in making decision to plan
- prepares economic development plan when required
- contributes to research and monitoring plan if required

contributes to plan monitoring and evaluation
reviews draft management plan
implements research and economic development as required

Resource Impact

contributes to habitat section of status report
reviews draft stock status report
advises on habitat plan
reviews draft management plan
carries out research

Inspection

contributes to status report if applicable
reviews draft stock status report
prepares fish inspection plan if required
reviews draft management plan
implements inspection plan

Appendix 2. Glossary of terms.

allocation: a portion of the safe harvesting level assigned to a particular person or group of people.

habitat: the place where a particular species lives including all other species with which it interacts.

monitoring: the collecting of information on the numbers and condition of the species being managed to determine whether numbers are being maintained with the management methods being used.

research: studies on a species or its habitat to obtain information required to manage it.

safe harvesting level: the number of animals which can be harvested from a stock such that the same number can be taken year after year without the population decreasing in numbers.

stock: a group of animals of a single species which breed with each other. They may mix with other stocks in some places at some times of year but do not breed with other stocks.

Appendix 3. A fishery management priority setting process.

A PROCESS FOR SETTING PRIORITIES FOR FISHERY MANAGEMENT PLANS

INTRODUCTION

Currently DFO, Central and Arctic Region manages about 350 stocks. There are 247 commercial fisheries for which DFO sets quotas. Safe harvest levels (SHL's) are set for only some of the over 250 domestic fisheries.

The Region contains a very large number of fish and marine mammal stocks, many of which are harvested in subsistence (over 250 stocks), recreational (125 stocks) or commercial fisheries (250 stocks). The total number of stocks managed is about 350. Quotas are set for the 247 commercial fisheries but safe harvest levels (SHL's) are set for only some of the 250 domestic fisheries and for only one recreational fishery. Other measures such as restricted seasons, catch limits and size restrictions are used for managing recreational fisheries.

Over half of the stocks are in fresh water, the management of which could be delegated to the NWT. The remainder is still a large number of stocks, and because of the limited number of personnel, it is not possible to prepare management plans for all of them proactively. Management plans can be prepared only for the stocks or groups of stocks or species which have the greatest need based on a number of factors such as cultural and economic significance and whether the stock is endangered or over-harvested. Even amongst the stocks which require a management plan it will be necessary to set priorities.

Priorities will be established by the Regional Director, Fisheries and Habitat Management, in consultation with F&HM staff, management boards, Science, and Economics.

Criteria for determining the importance of a stock are given below. The most important criterion will be the numeric status of the stock. For each criterion, points are awarded. The point system is arbitrary and subject to change with experience gained in using the procedure.

Each candidate stock will be scored and a decision made on which stocks are to be put into the process for the year on the basis of the score. Preliminary scoring will be the responsibility of the Area Manager.

CRITERIA AND POINT ASSIGNMENTS FOR DETERMINING STOCK MANAGEMENT PRIORITIES

1) Stock Importance/Type of Exploitation

There are three types of exploitation , namely domestic, commercial and recreational. Domestic exploitation is divided into aboriginal and non-aboriginal.

Self sufficiency, hunting and fishing are important components of the aboriginal culture. Fish resources often form a significant part of the diet in isolated communities where employment is hard to come by and store-bought food is very expensive. Protecting stocks for such uses are the first priority for DFO fisheries management. Aboriginal domestic harvesting is to receive priority for any stock and this use will receive extra points. Commercial and recreational fisheries can also be important by providing wage employment and other inputs to local economies.

If there is more than one type of exploitation of a stock it is more important to have a plan.

Stock Importance

# of users based on % of local population	0 to 10
$ value	0 to 10
# of people employed as % of work force	0 to 10
# of years of use	0 to 5
proximity to community	0 to 5
others	0 to 10

combinations to a maximum of 50 points

Type of Exploitation

aboriginal domestic	15
recreational	10
commercial	10
none	0

combinations to a maximum of 35 points

2) Level of Exploitation

The more heavily exploited the stock (based on the percentage of the SHL caught), the more likely it is to be over-exploited. Such stocks require a higher priority for management.

Exploitation Level	< SHL	0
	= SHL	10
	> SHL	20

3) Numerical Condition of Stock

If a stock shows no evidence of being threatened or endangered, and no change in the level of harvest is anticipated, the priority for a management plan would be low. The highest priority would be given to an endangered stock.

Condition of stock	
stable/increasing	0
declining	10
threatened	20
endangered	40

4) Future Harvest Plans

Economic development plans for a fish stock imply that an increase in harvest will occur (due to the commercial or recreational fishery). If there also is a domestic and/or existing recreational fishery, it is important that a management plan be prepared. If the stock will be exploited only commercially and there are no other concerns, a full management plan may not be required.

Future Harvest Plans	
to increase	10
no changes planned	0

5) Proximity of (Access To) Other Stocks of the Same Species

Higher priorities should be awarded to exploited stocks if there are no other stocks of the same species as easily accessible as the one being considered.

Proximity of Like Stocks	
yes, same distance	0
yes, within 25 km	10
yes, 25 - 50 km	15
yes, 50 - 100 km	20
no or over 100 km	25

6) Biological Factors

These include such measurements as intrinsic rate of increase, genetic diversity and response to environmental factors such as ice cover, temperature and salinity. Also included would be other habitat factors such as restricted overwintering areas, restricted migration routes and the like.

Species which have low reproductive rates (whales) are at more risk from exploitation and habitat disturbance than are faster reproducing species (most fish). Slowly reproducing species take much longer to recover from

over-exploitation or habitat damage and require more careful management. Similarly, other biological factors must be taken into account.

Biological Factors, for example:

fast rate of increase (e.g. Lake whitefish)	0
moderate rate of increase (e.g. Arctic charr	5
slow rate of increase (e.g. ringed seal)	10
very slow rate of increase (e.g. bowhead)	15

and other factors to a maximum of 30 points

7) Stock Distribution

Some stocks, such as ringed seals, are widely distributed at all times of year. Others, such as walrus occur in aggregations and others such as stocks of anadromous Arctic charr, have limited distributions and during migration and spawning are concentrated in small areas. During periods of aggregation or concentration, such stocks are highly vulnerable to exploitation. More attention has to be paid to the management of such stocks.

Stock Distribution

widely distributed	0
clumped	10

8) Ease of Enumeration

Although there are problems and it is very expensive, it is much easier to determine population levels of whales than of most fish, although Arctic charr populations in many rivers also are relatively easy to count. However, some fish populations, such as the coregonids of the Mackenzie drainage, may be virtually impossible to enumerate directly. For complete management plans, population numbers are required. For species which are really difficult to count, complete plans will not be possible.

Ease of Enumeration

easy	10
possible	5 (variable)
impossible	0

9) Threats to stock and/or habitat from man's activities

Threats to a population and/or its habitat from industrial development should be taken into account when determining priorities. Populations in areas where industrial developments are occurring bear closer examination than those in pristine areas, other factors being equal. The types of threat could be physical barriers to migration, degradation of water quality, noise, dredging, etc.

Other Threats

yes	5-20 (depending on threat)
no	0

FACTORS AFFECTING DFO's ABILITY TO PREPARE MANAGEMENT PLANS

Resources Available for Management

DFO resource levels, both human and fiscal are low, therefore, the number of management plans which can be produced will be limited. Management Boards have their own resources and their contribution to management planning will increase the number of plans possible.

Current Knowledge

What is known about a stock and its habitat will affect the development of a management plan. A certain amount of data is required to produce all sections of a management plan (stock size, biological data, habitat info., catch data, etc.). If the data are not available, the affected section cannot be completed. The presence or absence of data will not be apparent until after the stock status report has been written. If data are required, it will take time to obtain them. Obtaining data will be part of the research and monitoring or one of the other plans. Some of the individual plans will not be possible until data are collected.

Full or Partial Plan?

Whether a full management plan or a partial plan will suffice will be determined by the needs related to the particular stock. Some sections of the plan could be left out; for example, if there are no threats to fish quality, and no fish exported, an inspection plan could be omitted.

Appendix 4. Fishery management priority setting form.

This form is to be used in conjunction with the document titled "A Process for Setting Priorities for Fishery Management Plans" The document explains each of the categories listed below.

Stock Name _____ Species _____

Location _____

Nearest Communities _____

SCORING

1) Stock Importance/Type of Exploitation

a) Stock Importance

i) number of users based on % of local population (give figures) _____ (0 to 10) ____

ii) $ value (give value) (0 to 10) $_____ ____

iii) # of people employed as % of local employment (describe) _____ (0 to 10) ____

iv) # of years of use (state years of use) _____ (0 to 5) ____

v) proximity to community (state distance) (0 to 5) ___km___ ____

vi) others (specify) (0 to 10) _____ ____

Subtotal (maximum of 50) ____

b) Type of Exploitation

i) aboriginal domestic (15) ____

ii) recreational (10) ____

iii) commercial (10) ____

iv) none (0) ____

Subtotal (maximum of 35) ____

2) Level of Exploitation

< SHL (0)
= SHL (10)
> SHL (20) ____

3) Numerical Condition of Stock

stable/increasing (0)
declining (10)
threatened (20)
endangered (40) ____

4) Future Harvest Plans

plans to increase harvest (10)
no increases planned (0) ____

5) Proximity of (Access To) Other Stocks of the Same Species

yes, same distance (0)
yes, within 25 km (10)
yes, 25 - 50 km (15)
yes, 50 - 100 km (20)
no or over 100 km (25) ____

6) Biological Factors

a) rate of increase
fast rate of increase (eg lake whitefish) (0)
moderate rate of increase (eg Arctic charr (5)
slow rate of increase (eg ringed seal) (10)
very slow rate of increase (eg bowhead) (15) ____

b) other (specify) _____ (5-15 points) ____
c) other (specify) _____ (5-15 points) ____
d) other (specify) _____ (5-15 points) ____
e) other (specify) _____ (5-15 points) ____

Subtotal (maximum of 30 points)

7) Stock Distribution

widely distributed (0)
clumped distribution (10) ____

8) Ease of Enumeration

easy (10)
possible (5) (variable point assignment)
impossible (0) ____

9) Threats to stock and/or habitat from man's activities

no (0)
yes (specify) (5-20 depending on threats) _____ ____

Total ____

Comments: _____